INSULATING JACKET STRUCTURE OF A STATOR OF A DIRECT CURRENT MOTOR

Background of the Invention

1. Field of the Invention

The present invention relates to an insulating jacket structure of a stator of a direct current motor, and more particularly to an insulating jacket structure of a stator of a direct current motor, wherein the insulating jacket may be wrapped on the outer periphery of the silicon steel plate assembly of the stator conveniently, and may be combined with the silicon steel plate assembly of the stator.

2. Description of the Related Art

A conventional stator structure of a radial winding direct current motor in accordance with the prior art shown in Fig. 7 comprises an upper insulating jacket 91, a lower insulating jacket 92, and a silicon steel plate 93. The upper insulating jacket 91 and the lower insulating jacket 92 are formed with mating positioning holes 94 respectively for passage of positioning members 95, such as pins. After the upper insulating jacket 91, the lower insulating jacket 92 and the silicon steel plate 93 are combined with each other, the poles of the silicon steel plate 93 may be wound with windings, thereby forming the conventional stator structure of a radial winding direct current motor.

However, fabrication of the conventional stator structure of a radial winding direct current motor is inconvenient, thereby increasing the cost of fabrication.

Summary of the Invention

The primary objective of the present invention is to provide an insulating jacket structure of a stator of a direct current motor, wherein the

insulating jacket may be assembled and combined with the silicon steel plate assembly of the stator conveniently, and the cost of fabrication may be reduced.

In accordance with the present invention, there is provided an insulating jacket structure of a stator of a direct current motor includes an insulating jacket body having a through hole, and multiple extension plates extended outward from the through hole of the insulating jacket body in a radiating manner. Each of the multiple extension plates has a receiving recess whose cross-section is substantially inverted U-shaped. The receiving recess of each of the multiple extension plates has two sides having two distal ends each formed with a protruding locking snap. Multiple outer annular plates are extended outward from the two sides of the receiving recess at the distal ends of each of the multiple extension plates, and a gap is formed between any two adjacent outer annular plates. The poles of the silicon steel plate assembly of the stator are received in the receiving recess of the insulating jacket, and the silicon steel plate located at the lowermost layer of the silicon steel plate assembly is snapped and locked by the locking snaps protruded from the two distal ends of the receiving recess.

Further benefits and advantages of the present invention will become apparent after a careful reading of the detailed description with appropriate reference to the accompanying drawings.

Brief Description of the Drawings

Fig. 1 is a top plan assembly view of an insulating jacket structure of a stator of a direct current motor in accordance with a first embodiment of the present invention;

Fig. 2 is a cross-sectional view of the insulating jacket structure of a stator of a direct current motor taken along line 2-2 as shown in Fig. 1;

Fig. 3 is an exploded perspective view of an insulating jacket structure of a stator of a direct current motor in accordance with a first embodiment of the present invention;

Fig. 4 is a top plan assembly view of an insulating jacket structure of a stator of a direct current motor in accordance with a first embodiment of the present invention, wherein the insulating jacket is combined with a silicon steel plate assembly;

Fig. 5 is a cross-sectional view of the insulating jacket structure of a stator of a direct current motor taken along line 5-5 as shown in Fig. 4;

Fig. 6 is an exploded perspective view of an insulating jacket structure of a stator of a direct current motor in accordance with a second embodiment of the present invention; and

Fig. 7 is an exploded perspective view of a conventional stator structure of a radial winding direct current motor in accordance with the prior art.

Detailed Description of the Preferred Embodiments

Referring to the drawings and initially to Figs. 1-3, an insulating jacket of a stator of a direct current motor in accordance with a first embodiment of the present invention is shown. The insulating jacket is made of insulating material, such as plastics or the like, and comprises a body 1, multiple extension plates 2, and multiple outer annular plates 3.

The body 1 has a proper height, and has a through hole 11 for passage of a shaft tube.

The multiple extension plates 2 are extended outward from the through hole 11 of the body 1 in a radiating manner. In the preferred embodiment of the present invention, the multiple extension plates 2 are distributed about the center of the through hole 11 of the body 1 in an equally

angular manner. The cross-section of each of the multiple extension plates 2 is substantially inverted U-shaped, thereby forming a receiving recess 21. The receiving recess 21 of each of the multiple extension plates 2 has two sides having two distal ends each formed with a protruding locking snap 22. Each of the multiple extension plates 2 is provided with a protruding plate 23 opposite to the receiving recess 21, so that the coating wires may have a better positioning effect during the winding process after the insulating jacket is mounted on a silicon steel plate assembly 4.

The multiple outer annular plates 3 are connected at the distal ends of the multiple extension plates 2, and are extended outward from the two sides of the receiving recess 21. Two adjacent outer annular plates 3 are not connected, and a proper gap 31 is formed between any two adjacent outer annular plates 3.

Referring to Figs. 4 and 5, the body 1 is combined with the silicon steel plate assembly 4. After lamination of the silicon steel plate assembly 4, the silicon steel plate assembly 4 is placed in the insulating jacket directly. The multiple extension plates 2 are mounted on the poles 42 of the silicon steel plate assembly 4, and the lowermost layer of the silicon steel plate assembly 4 are snapped and locked by the locking snaps 22. Thus, the silicon steel plate assembly 4 may be hidden in the insulating jacket. At this time, the hub 41 of the silicon steel plate assembly 4 is located in the through hole 11 of the body 1, each of the poles 42 is received in the receiving recess 21 of each of the multiple extension plates 2, and the pole face 43 is located outside of the multiple outer annular plates 3. Thus, when the coating wires are placed into the gaps 31 between the multiple outer annular plates 3 to perform the winding work, the coating wires may be wound around the peripheral surface of the multiple extension plates 2 between the body 1 and the multiple outer annular plates 3 of the insulating jacket. Each of the poles 42 of the silicon steel plate

assembly 4 are snapped and locked by the locking snaps 22 at the two sides of the receiving recess 21 of each of the multiple extension plates 2, so that a distance is formed between each of the poles 42 of the silicon steel plate assembly 4 and the top of the locking snap 22 of the receiving recess 21 of each of the multiple extension plates 2. Thus, when the coating wires are passed through the receiving recess 21 of each of the multiple extension plates 2, the coating wires will not contact the poles 42. Further, when each of the multiple extension plates 2 is provided with the protruding plate 23, the wound coating wires may be collected and positioned on the peripheral surfaces of the multiple extension plates 2, and will not slip from the multiple extension plates 2.

Referring to Fig. 6, an insulating jacket of a stator of a direct current motor in accordance with a second embodiment of the present invention is shown. The insulating jacket comprises a body 1, multiple extension plates 5, and multiple outer annular plates 6.

The body 1 has a proper height, and has a through hole 11 for passage of a shaft tube.

The multiple extension plates 5 are extended outward from the through hole 11 of the body 1 in a radiating manner. Each of the multiple extension plates 5 has different widths, and has a first end connected to the body 1, and a second end opposite to the first end and having a width smaller than that of the first end. The cross-section of each of the multiple extension plates 5 is substantially inverted U-shaped, thereby forming a receiving recess 51. The receiving recess 51 of each of the multiple extension plates 5 has two sides having two distal ends each formed with a protruding locking snap 52. Each of the multiple extension plates 5 is provided with a protruding plate 53 opposite to the receiving recess 51, so that the coating wires may have a better

positioning effect during the winding process after the insulating jacket is mounted on a silicon steel plate assembly 4.

The multiple outer annular plates 6 are connected at the distal ends of the multiple extension plates 5, and are extended outward from the two sides of the receiving recess 51. Two adjacent outer annular plates 6 are not connected, and a proper gap 61 is formed between any two adjacent outer annular plates 6. Thus, when the insulating jacket is combined on the silicon steel plate assembly 4 to perform the winding work, the coating wires may be wound around the peripheral surface of the multiple extension plates 5 between the body 1 and the multiple outer annular plates 6 of the insulating jacket, and the coating wires are collected toward a direction apart from the pole face 43 of the silicon steel plate assembly 4. Thus, the magnetic flux produced by the coils may be output from the pole face 43 directly, thereby reducing the magnetic resistance, and the motor may produce a greater rotation torque.

Accordingly, in the insulating jacket structure of a stator of a direct current motor in accordance with the present invention, the insulating jacket may be combined with the silicon steel plate assembly easily and conveniently, thereby reducing the working processes and steps, and thereby reducing the cost of fabrication. In addition, the pole between the extension plate and the silicon steel plate assembly has a first end whose width is greater than a second end of the pole. Thus, the wound coils may be collected toward the pole face of the silicon steel plate assembly, so that the magnetic flux produced by the coils may be output from the pole face directly of the silicon steel plate assembly, thereby reducing the magnetic resistance, and the motor may produce a greater rotation torque.

Although the invention has been explained in relation to its preferred embodiment as mentioned above, it is to be understood that many other

possible modifications and variations can be made without departing from the scope of the present invention. It is, therefore, contemplated that the appended claim or claims will cover such modifications and variations that fall within the true scope of the invention.